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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/507,346	09/13/2004	Shinji Tanaka	2271/72985	3783
23432	7590	08/24/2005	EXAMINER	
COOPER & DUNHAM, LLP 1185 AVENUE OF THE AMERICAS NEW YORK, NY 10036			FEGGINS, KRISTAL J	
			ART UNIT	PAPER NUMBER
			2861	
DATE MAILED: 08/24/2005				

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/507,346

Applicant(s)

TANAKA, SHINJI

Examiner

K. Feggins

Art Unit

2861

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM  
THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 09 June 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-8 is/are allowed.
- 6) ☐ Claim(s) 9-23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 9, 10, 12, 14, 15, 17, 18, 19, 20, 21, 22 & 23 are rejected under 35 U.S.C. 102(b) as being anticipated by Seiichi Inoue (JP 2002067303 A).

#### **Inoue discloses the following claimed limitations:**

- \* regarding claims 9, 15, 18, 19, 20, 21 & 23 an electrostatic actuator (Abstract, figs 3-6)

- \* a vibration chamber having at least one side thereof formed by a diaphragm deformable by an electrostatic force (Abstract, figs 1-3);

- \* an electrode provided opposite the diaphragm (Abstract, figs 1-3);

- \* a pressure correcting chamber communicating with the vibration chamber, the pressure correcting chamber having at least a first side thereof formed by a deformable part that is displaceable in accordance with an external pressure (figs 1-3),

- \* the electrostatic actuator having a part that reduces an area of contact formed when the deformable part comes into contact with a second side of the pressure correcting chamber, the second side opposing the deformable part (Abstract, figs 1-3).

\* regarding claim 10, wherein at least one projection is formed on a side of the deformable part which side opposes the second side of the pressure correcting chamber (Abstract, figs 1-3).

\* regarding claim 12, wherein at least one projection is formed on the second side of the pressure correcting chamber (Abstract, figs 1-3).

\* regarding claim 14, wherein surface roughening is performed on the second side of the pressure correcting chamber so that surface roughness thereof is increased (Abstract, figs 1-3).

\* further regarding claim 15, the electrostatic actuator comprising a sticking preventing part formed, on a second side of the pressure correcting chamber so as to prevent the deformable part from sticking to the second side when the deformable part comes into contact therewith, the second side opposing the deformable part (Abstract, figs 1-3).

\* regarding claim 17, wherein the sticking preventing part is a conductive layer (Abstract, figs 1-3).

\* further regarding claims 18, 19, 20, 21, 22 & 23, a liquid droplet/ink jet ejecting head (Abstract, figs 1-3).

- \* a nozzle ejecting a liquid droplet (Abstract, figs 1-3).

- \* a pressure liquid chamber containing liquid to be ejected, the pressure liquid chamber communicating with said nozzle (Abstract, figs 1-3);

- \* an electrostatic actuator pressurizing the liquid in said pressure liquid chamber (Abstract, figs 1-3),

- \* further regarding claims 19, 21 & 23, the electrostatic actuator comprising a sticking preventing part formed on a second side of the pressure correcting chamber so as to prevent the deformable part from sticking to the second side when the deformable part comes into contact therewith, the second side opposing the deformable part (Abstract, figs 1-3).

- \* further regarding claims 20; 21 an ink-jet recording apparatus (Abstract, figs 1-3).

- \* further regarding claims 22 & 23, a liquid supply cartridge integrating a liquid droplet ejecting head and a liquid supply tank supplying liquid thereto (Abstract, figs 1-3).

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 11 & 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Seiichi Inoue (JP 2002067303 A) in view of Kunihiro Yamanaka (JP 2002240282 A).

**Inoue discloses all of the claimed limitations except for the following:**

\* wherein the projection is formed of a material selected from a group of silicon oxide and nitride oxide.

**Yamanaka discloses the following claimed limitations:**

\* wherein the projection is formed of a material selected from a group of silicon oxide and nitride oxide (Abstract, figs 3, 5, 9-13, 15 & 16) for the purpose of achieving low cost and high reliability.

It would have been obvious at the time of the invention was made to a person having ordinary skill in the art to utilize a projection that is formed of a material selected from a group of silicon oxide and nitride oxide, taught by Yamanaka into into Inoue for the purpose of achieving low cost and high reliability.

5. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Seiichi Inoue (JP 2002067303 A) in view of Koji Kitahara et al. (JP 2000299991 A).

**Inoue discloses all of the claimed limitations except for the following:**

\* wherein the sticking preventing part is a hydrophobic film.

**Kitahara et al. disclose the following claimed limitations:**

\* wherein the sticking preventing part is a hydrophobic film (Abstract) for the purpose of providing an electrostatic actuator having high durability.

It would have been obvious at the time of the invention was made to a person having ordinary skill in the art to utilize the sticking preventing part that is a hydrophobic film, taught by Kitahara et al. into Inoue for the purpose of providing an electrostatic actuator having high durability.

***Response to Arguments***

6. Applicant's arguments filed 6/9/2005 have been fully considered but they are not persuasive. In response to Applicant's argument that Inoue does not disclose a reduced area of contact formed when the deformable part comes into contact with a second side of the pressure correcting chamber is acknowledged. However, the projection stoppers do reduce the area of contact formed when the deformable part comes into contact with a second side of the pressure correcting chamber. Any object, protrusion, projection facing the deformable would prevent it from touching the electrodes, thereby reducing the area in which the deformable part is deformed within. Even if the projection stoppers are to prevent the thin film electrodes for coming into contact with each other, they also decrease the space in which the deformable part is deformed within.

***Allowable Subject Matter***

7. Claims 1-8 are allowed.

The following is an examiner's statement of reasons for allowance: The primary reason for allowance of claims 1-5 is the inclusion of the limitations of a liquid droplet ejecting head that includes a deformable plate whose deformation is greater than a total

deformation of the diaphragms, the deformable plate forming a wall face of the common liquid chamber. It is this limitation found in the claims, as they are claimed in the combination of that has not been found, taught or suggested by the prior art of record, which makes these claims allowable over the prior art.

The primary reason for allowance of claim 6 is the inclusion of the limitations of an ink cartridge that includes a deformable plate whose deformation is greater than a total deformation of the diaphragms, the deformable plate forming a wall face of the common liquid chamber. It is this limitation found in the claims, as they are claimed in the combination of that has not been found, taught or suggested by the prior art of record, which makes these claims allowable over the prior art.

The primary reason for allowance of claim 7 is the inclusion of the limitations of an ink cartridge that includes a deformable plate whose deformation is greater than a total deformation of the diaphragms, the deformable plate forming a wall face of the common liquid chamber. It is this limitation found in the claims, as they are claimed in the combination of that has not been found, taught or suggested by the prior art of record, which makes these claims allowable over the prior art.

The primary reason for allowance of claim 8 is the inclusion of the limitations of an ink cartridge that includes a deformable plate whose deformation is greater than a total deformation of the diaphragms, the deformable plate forming a wall face of channel. It is this limitation found in the claims, as they are claimed in the combination of that has not been found, taught or suggested by the prior art of record, which makes these claims allowable over the prior art.



### Communication With The USPTO

8. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to K. Feggins whose telephone number is 571-272-2254. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Talbott Dave can be reached on 571-272-1934. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

 8/05  
**K. FEGGINS**  
**PRIMARY EXAMINER**